

REMARKS

By way of the present response, the specification has been amended to correct minor typographical informalities and claims 1, 5 and 9 have been amended. Claims 1-9 currently are pending. Favorable reconsideration is respectfully requested.

The Office Action includes a rejection of claims 1, 5 and 9 under 35 U.S.C. 102(b) as being anticipated by the Chang et al. document (International Publication No. WO 98/50869), and a rejection of claims 2-4 and 6-8 under 35 U.S.C. § 103 as allegedly being unpatentable over Chang et al. document in view of the Ahanger article ("Video Query Formulation," Proceedings of the SPIE, SPIE, vol. 2420, 1995, pages 280-291). These rejections are respectfully traversed, insofar as they may be considered to apply to the amended claims.

It is respectfully submitted that the Chang et al. document fails to describe or suggest the combination of features set forth in the amended independent claims, whether or not this document is considered in combination with the Ahanger article. For instance, independent claim 1 has been amended to recite features from dependent claim 2, and to further clarify that tracking of object regions is performed in all frames *only* of shots determined to have at least one similar object based on the corresponding query object based initial object regions. More particularly, claim 1 recites, among other features, the steps of determining whether there exists an object similar to each of the query objects in each of the key frames and extracting the similar objects as corresponding query object based initial object regions from each of the key frames, and for each query object, tracking object regions in all frames of only shots determined to have a respective similar object in a key frame based on the corresponding query object based initial object regions. Claims 5 and 9 have been amended to recite similar features with respect to an apparatus and steps of a computer program embedded in a computer-readable medium. Support for these amendments is found, for example, on page 8, lines 13-15, and in Figure 3B and the description thereof starting at line 16 of page 9 of the specification. The

differences between the cited references and the pending independent claims are pointed out in the following analysis of these documents.

In setting forth the rejection of independent claims 1, 5 and 9, the Office asserts that the Change et al. document discloses the claimed apparatus and methods, with reference to the description starting at line 20 of page 13. However, in contrast to what is set forth in the amended independent claims, the cited parts of Chang et al. describe a system and method in which segmentation and tracking is performed for *every* frame in *every* video clip being processed. For instance, Change et al. describes that for each clip, a current frame *n* is tracked based on segmented regions from a previous *n-1* frame (see Figure 4, "SEGMENTED REGIONS FROM FRAME *n-1*" associated with current frame 401 of video clip 400 and page 15, lines 3-4). This type of tracking in Chang et al. appears to be performed for *every* clip separated from raw data, whether or not a current frame is found to contain an object of a query. Hence, Chang et al. does not describe features related to selecting one or more key frames from each of the shots, determining whether there exists an object similar to each of the query objects in each of the key frames and extracting the similar objects as corresponding query object based initial object regions from each of the key frames, and for each query object, tracking object regions in all frames of *only shots determined to have a respective similar object in a key frame* based on the corresponding query object based initial object regions, as recited in amended independent claim 1, and similarly set forth in amended independent claims 5 and 9.

The Ahanger document also fails to teach, or even suggest these features. In section 12 of the Office Action, the Examiner states:

Ahanger teaches on page 287 in paragraph four that a video sequence querying system could be implemented to allow for on-the-fly indexing using user specified objects.

However, the relied upon description in Ahanger of on-the-fly indexing involves selecting a frame, using an editing tool to cut an object out from the selected frame and then submitting the resultant picture to a database for on-line or off-line indexing. From the submitted picture, the system of Ahanger creates an icon for the selected

object (see, the paragraph 4 of page 287, lines 4-5) that can be used when formulating a query (see, page 287, line 4). It is respectfully submitted that the Ahanger article discusses no particulars relating to the claimed combination of features concerning determining whether there exists an object similar to each of the query objects in each of the key frames and extracting the similar objects as corresponding query object based initial object regions from each of the key frames, and tracking object regions in all frames of only shots determined to have at least one similar object in their key frame based on the corresponding query object based initial object regions, as set forth in independent claims 1, 5 and 9.

Even if one were to consider, for the sake of argument, that one of ordinary skill in the art would have been led to modify the Chang et al. system as proposed in the Office Action, such hypothetical combination would not have remedied the shortcomings of the Chang et al. document pointed out above. Indeed, section 12 of the Action goes on to state: "In order to implement such a system the entire video sequence would have to be searched for the object." Hence, the Office appears to acknowledge that the system of Chang et al. operates to segment and track every frame of *every* clip regardless as to whether a current frame is determined to include an object specified in a query. In contrast, the present invention utilizes, *inter alia*, the concept of tracking object regions in all frames of *only* shots determined to have the an existing object region similar to the query objects in one or more selected key frames thereof. Because neither the Chang et al. nor Ahanger teach or suggest this concept broadly encompassed in each of the independent claims, combination of these documents would also fail to teach or suggest the present invention.

For at least these reasons, the Chang et al. and Ahanger documents, whether considered individually or in combination, fail to teach or suggest the combinations of features recited in each of independent claims 1, 5 and 9.

Claims 2-4 and 6-8 depend from one of independent claims 1 and 5 and are therefore allowable for the above reasons, and further for the additional features recited.

From the foregoing, Applicants respectfully submit that the present application is in condition for allowance. Prompt notification of the same is earnestly solicited.

Respectfully submitted,

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